PSYCHOLOGY AND THE NAVY

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THE world is full of the glory of the development of modern battle-ships, full of admiration for the tremendous material values which they represent and for the technical triumphs which are achieved by the perfection of their guns and machinery. The world of newspaper readers is hypnotized by the stupendous possibilities which the Dreadnoughts of our day have created, and its imagination is excited by the improvements and inventions, by the torpedoes and submarines, and the turrets which make the naval battle of the future the most gigantic technical problem of the age. But in the midst of this unquestioning enthusiasm for the material development and the physical progress of the battle-ship we ought not to forget that it is, after all, the man, man's thought and man's emotion and man's will which is of decisive importance. It is a popular prejudice to expect success only from the marvels of steel and powder and electricity. The great lesson of history demonstrates that throughout four thousand years the victory has been with the ships of those who were fit to win. It is not true that fate has been with the heavy guns; it has always been with the great minds. The knowledge of the ships and armament becomes a living power only if it is embedded in the understanding of strategics and grand tactics, and they would be empty if the psyche of man were not acknowledged as their center. With this background of feelings the men of the navy have turned to psychology to inquire whether the study of the mind may be made serviceable to the navy in peace or in war.

The psychologist of a few years ago would have felt embarrassed if men of that great world in which guns are pointed and battles fought had come as intruders into his quiet laboratory-rooms, where he was carrying on his patient

researches into the traits and the mechanism of the human mind. His science had grown up far from the turmoil of the world of clashing interests in the repose and quietude of pure academic life. Psychologists studied consciousness, its laws, and its surprising developments with all the means of exact modern methods, but never with a thought of dragging the results into the market-places and of making practical use of that which was sought for knowledge's sake only. But the last few years have brought a radical change. The treasures of knowledge which were heaped up in the store-houses of the modern psychologist have at last been coined and made serviceable to the demands of the day. The psychologists began to aid the efforts of the school-teachers who had too long forgotten that the human mind of the pupil is the only important element in the school; they began to help the physicians who had too long neglected the fundamental rôle which the mind plays in the health and disease of the patient; they began to aid the lawyer and the judge who had too long dealt with crime without analyzing the criminal's mind; they even began to aid the merchant and the captain of industry whose customers and whose laborers are minds which may be studied with profit from the point of view of psychological science. They have served the social reformer and the vocational counselor, even the artist and the minister; in short, they have in recent years developed an applied psychology which stands to the theoretical work of our laboratories as the science of the engineer stands to physics or chemistry. It is a psychotechnical science which cannot acknowledge barriers where the human mind is working in the interplay of social energies. Commanding a ship or fulfilling the orders of the commander, shaping the plans of a battle or pointing the gun, directing a submarine or aiming a torpedo, sending the wireless message or even feeding the engines in the hold of the ship while the cannons are thundering, is an activity of the mind, and it is not only the right, but the duty, of the psychologist to consider conscientiously whether his science may not be applied in this realm of human efficiency too.

The problems which might most naturally suggest themselves at the very threshold are those which are common to the seafaring world independent of whether the ship is to fight or peacefully to carry passengers and freight from shore to shore, the problems of navigation. We ought not

to overlook the fact that certain elements of exact psychology indeed entered the naval service quite a number of years ago. I refer to the study of color-blindness. No one has a right to become a seaman who is unable to discriminate the color signals of the passing ships, but these facts of color-blindness which are to-day such a matter of course in the naval world had to be slowly examined by psychological studies, and the tests by which these abnormities of the human eye are traced are still being steadily elaborated in the workshops of the psychologists. Even in this apparently well-known little field the psychologist goes on discovering new phenomena. Many types of color-weakness and color-deficiency can be traced to-day which a few years ago would still have escaped the notice of the experimenter; and the more intimately the naval service remains in contact with the progress of these sense studies, by introducing the newest subtle methods of testing, the greater the chance of eliminating mistakes which might spell disaster.

I am inclined to believe that variations and deficiencies of hearing, well known to the psychologist, may be of a certain significance too in the problems of navigation. Only in recent years has a careful psychological study been devoted to the mental conditions of the localization of sound. The experiments which aimed at determining the directions of sound which can be discriminated were carried on in the hope of clearing up the theory of space perception. The psychologist, studying space perception, asks how far the cooperation of the two ears is necessary in order to determine exactly the direction and what angles of deviation can be discerned and what directions of sound may be confused with one another. No one of these laboratory studies was undertaken with practical purposes in view, and yet it seems probable that the officer who is to determine the direction of the fog-horn's sound would profit from an acquaintance with such psychological investigations, and that psychological tests might eliminate many a man from the list of those who are considered competent to judge the sounds in a fog. The new duty of listening to the submarine bells involves other acoustical functions which may also make psychological inquiries advisable. But the mental analysis would trace strong individual differences with regard to many other features which might mean good or evil for the profession of the navigator.

The officer on the bridge is in a very different position, according to whether his mental imagery is of the visual or of the motor-acoustical type. The one may carry in consciousness a vivid picture of the map of the shore, with its lighthouses and signals, while the other may possess his knowledge in the form of words and figures. Both may know the same data, and each kind of knowledge has its particular advantages for certain purposes, but the two men take an entirely different attitude toward the channel through which they have to pass, and the difference may be momentous. Still more important are the psychological differences in the ability of men to observe distant objects and to remember correctly a series of events to which the attention has been turned. The absurd contradictions in the reports of witnesses before the court provoked the psychological study of the ability for giving testimony. Thousands of experiments have been devoted to the question under the exact conditions of the laboratory experiment. We know now how misleading the reports of the most sincere witnesses may be, how illusions may slip in, in spite of the most serious intentions, how the subjective feeling of certainty may deceive them point for point, and, above all, how great the individual differences are in the faithfulness of mental reports. The sea-serpent stories of all regions have indicated how the sea is the most favorable background for the illusions of mental perception. We know from recent studies that, for instance, a quick succession of similar impressions produces a mutual inhibition through which some are eliminated from the range of our attention. The psychologist has found many such subtle traits of our attention which interfere with our observations, and if we think how much depends upon the observation of the naval officer on the commercial ship, as well as on the man-of-war, we can foresee that the time must come when the studies of the psychologist will not be ignored in the navy. Moreover, we find by experimental inquiry that the power of observation is dependent upon individual features, and that, accordingly, a man may be excellent in one kind of observation and entirely unreliable in another kind, in spite of his personal feeling that he is exerting an equal effort. These individual differences must be tested in order to find which man is particularly fit for a certain kind of observation and whose judgment is unreliable. Similar psychological tests would

be advisable for the spotter on the mast and for the men in many another position.

To illustrate these possibilities of psychological tests which may be applied in the interest of navigation, I may characterize at least one a little more in detail. The officer on the bridge may know exactly what he has to do under normal conditions and may be perfectly able to figure out carefully the right decision in case of an unusual, unexpected, complex situation, if he has plenty of time to judge on the relative value of the various factors involved. But the ultimate proof of the man comes when the unexpected happens and no time is left for the slow decision. A quick decision must be made or destruction of ship or life will follow. A vessel may suddenly loom up in the mist, or a rock or a wreck, and collision is inevitable unless the right actions are quickly chosen, and this means unless rapidly and yet correctly the comparative importance and insistence of the conditions are grasped. Only the man who can live up to this demand of an emergency is the born leader of a ship as far as mere navigation is concerned.

Experience for which mankind has dearly paid has shown that there are two types of men who utterly fail. One type becomes paralyzed under the pressure of the sudden responsibility. The feeling that a decision must be quickly reached inhibits in him every impulse to action, his mind comes to a standstill, before he reaches any decision at all the chances are gone, and the disaster can no longer be averted. The other type instantly opens the channels of motor discharge, but the flood of impulses rushes into any chance course and a haphazard result, a foolish decision, or an unconsidered hasty action is the outcome. The right man is of the third type, which, under the pressure of danger, without loss of time instinctively grasps the whole complex situation, is not carried away by any chance impression, does not overlook what is significant in the unexpected event, sees the important things great and the insignificant small. Coolly he chooses in immediate response the attitude which he would take if he had time for careful deliberation. Are we to wait until an emergency arises to find out whether the right type of personality is in command? May not the penalty of this postponement be measureless loss of valuable lives?

A leading ship company raised this neglected question

recently with great earnestness and invited me as psychologist to consider whether our laboratory could not devise a scheme by which this ability to judge rapidly and yet correctly could be tested and measured. I tried many schemes, at first very complicated ones, but slowly I settled on an extremely simple device which brings out with surprising clearness the mental differences and the variations of those three types of behavior. The device looks like a little game. I use twenty-four cards, each of which contains four rows of twelve capital letters. They are all A's, E's, O's, and U's. Some of the cards contain twenty-one of one of the four letters and nine of each of the three others; some contain eighteen of the one and ten of each of the others; and some fifteen of the one and eleven of each of the three others. The letters are in entirely irrgular order and every card at the first glance looks almost bewildering. The task of the man to be tested is to stare at one card and to decide as quickly as possible which of the four letters is the most frequent one. It is evident that this is much more difficult if the most frequent letter occurs only fifteen times than when it occurs twenty-one times, but even in the latter case it is not easy to do it without any help by counting, for which, of course, no time is allowed. The full experiment consists in making this decision as quickly as possible for every one of the twenty-four cards, and the objective test is made by the demand that the subject of the experiment arrange the cards with the greatest possible speed in four piles: in the first those in which the A is predominant, in the second the E, in the third the O, and in the fourth the U. Then we measure the time from the signal to begin to the moment of laying down the last card, and afterward we count the number of times a card has been put in the wrong pile. Every mistake in the twenty-one letter cards counts four, in the eighteen letter cards three, in the fifteen letter cards one. If we sum up the mistakes and multiply by the number of seconds used, a product less than four hundred characterizes a man perfectly reliable in quick judgment of a complex situation, four hundred to a thousand normal, one thousand to two thousand fair, two thousand to three thousand doubtful, three thousand to five thousand poor, and over five thousand useless. Through a test which takes only a few minutes we thus arrive at a sorting of men according to their quickness or

sluggishness, deliberateness or inability to make a prompt decision. It is surprising how often men tested with this simple device confess that the result expresses exactly the experience which they have passed through when life called them to a sudden decision in an unexpected complex situation. Nevertheless, I am far from saying that the ideal of a test for this particular demand has been reached in this proposition. Still more suitable schemes may be invented in the future, but at least we no longer have any right to ignore the problem and to disregard the possibilities which experimental psychology offers, and to wait until the events of life carry on the experiments with disastrous results. For our purpose I have discussed this particular case only as an illustration of the method by which the experimental psychologist, with his miniature repetitions of life tasks, may seek the right man for the right place even on the bridge of the ship or in the crow's-nest or in the engine-room.

The officer in the navy, however, does not think primarily of those psychological features which are as important for the ocean greyhounds of the commercial fleet as for his ironclad floating fortresses. His interest naturally turns to those traits of the mind which are more directly connected with the success or failure in warfare. Hence let us consider that wide region of higher mental activities, the interplay of emotion and volition, judgment and imagination, intellect and instinct. But then we shall do best in our survey to discriminate between the minds of the officers and those of the crew. What are the mental characteristics of the many to whom the few have to give their orders? One psychological fact ought to stand in the foreground and ought never to be forgotten. The many are not simply a large number of single minds; they are not only many, but they are at the same time one. They are held together—more, they are forged together into one compact mental mass in which no single mind which entered has remained unchanged in its structure or in its energies. Let us by no means believe that this is only a metaphor or a picturesque expression which is to symbolize the fact that those hundreds of men have certain ideas or desires or emotions or feelings or prejudices or hopes or fears in common, and that the superior may simply rely on those common factors and, accordingly, ignore the individual differences among the men. Their unity is not a simple uniformity; their minds are

interrelated and not simply added to one another. Yet we must keep just as far from any reminiscences of popular mystical ideas, as if by a kind of telepathy one mind reaches out to another and fuses with it in a spiritual communion. Seen from a psychological standpoint, the personality is completely confined to the impressions, memories, imaginations, emotions, and volitions which originate in its own compass, and no mind can intrude into this mental individuality. Whatever comes to the individual mind from without must come through the senses in the form of impressions and sense perceptions. But when these impressions are perceptions not of the dead things around us, but of living beings animated by interests like ours and engaged in action with us, the impression influences the whole setting of the mind in one characteristic direction. The psychologist characterizes this as an increase of suggestibility. The particular man becomes more suggestible to all propositions which his senses receive from his companions. This psychophysical increase of suggestibility transforms the individuals now into a crowd, now into a rushing mob, now into an enthusiastic army, and whoever deals with such a group of men in which every one knows himself as a part of the cooperating whole must be fully aware of the advantages and of the dangers which are created by this reinforcement of suggestibility.

Suggestibility in the view of the modern psychologist means the readiness to accept suggestions, and suggestions are never anything but propositions for actions. In ordinary talk we speak of suggestions of ideas, but in a stricter sense this is misleading. Not the idea itself becomes the object of the suggestion, but either the proposition to act according to a certain idea or the proposition to believe in the reality of a certain idea. If we suggest the idea of a flower garden to a hypnotized man within the walls of his room, we do not simply awaken the imaginative idea before his mind. We might awake such an imaginative picture of a garden in any normal mind by speaking about it without hypnotism and without suggestion. What characterizes the abnormal state of the hypnotized man is that he is ready to accept the proposition that such a garden really surrounds him, and, accordingly, he begins to pick the roses from his chairs and tables. He accepts those ideas as real, and this is indeed ultimately nothing but an attitude, and

his action an action of submission and of acknowledgment. All suggestions in this way refer to the inner or outer doings of men.

Now ordinarily, if we propose an action to our neighbor, the idea of the purpose may interest him, and if no objections arise in his mind and no impulses of his oppose, the idea of the action transforms itself into a real activity. But it may just as well happen that our proposition awakens in his mind the idea that the consequences of the action would be disagreeable, or that it would be useless or foolish or perhaps even criminal, or that he would be unable to carry it out, or that a risk would be connected with it, or that it would be against the rules, and any one of these associated ideas might overcome the impulse to carry out the proposition. He refuses to do what we invited him to undertake because the opposing idea proves to be the stronger. But the idea of an action may be proposed to us with such vividness and warmth, with such a striking tone of authority, or with such insistent persuasiveness, that all those resisting associations are suppressed and inhibited. The inner opposition is overwhelmed, the proposed action is carried out, and in the case that a proposition has such a power to inhibit the opposing ideas we call it suggestion. Yet this effect may result and does result still oftener from an inner state of the man. He may have come into a readiness to yield to propositions which he would otherwise resist, to perform acts which would normally appear to him silly or dangerous. This inner change is the increase of suggestibility. Emotional excitement, over-fatigue, certain drugs, produce this change. If the change reaches its maximum degree we call it hypnosis, as the hypnotic state is indeed nothing but highly increased suggestibility. But with normal men there is no more effective cause for the increase of suggestibility than the forming of a mass in which every one sees and knows that all the others share his fate, have the same to perform and to enjoy and to suffer. The children in a class, the laborers in a factory, the voters in a mass-meeting, the spectators on the bleachers at a game, the crowd assembled at a fire or an accident, form various types of such organized units held together by increased suggestibility, through which every single member is liable to act in a way which would be unnatural to him if he were alone. He may do acts or say things or risk

dangers which he would fear if he stood by himself. He has not really become more courageous, but his increased suggestibility makes him imitative and ready to do what the others seem willing to do and to ignore the warning voice of his reason or his cowardice. He also becomes a little more foolish than he would be in isolation, he may shout words or indulge in actions which would appear to him silly or inconsiderate if he were alone; but the crowd consciousness has control of him; he has become insensitive to the opposing voice of wisdom. He laughs where he would never laugh alone; he runs away where his normal instincts would teach him to hold on; he gets discouraged or excited where the cold facts would not warrant either. The mass can hold his mind down to a level far below its true nature and can lift it up to a height which it could never reach unsupported.

Among all lasting conditions of human life, no one seems more predisposed to create this increased suggestibility of a mass than the life on a war-ship. Every man on board feels how his fate is bound up with that of all the others. He knows that they all are detached for months and years from the life of the millions; they feel the same pulse of the engines; they are lifted by the same waves; they know that the same danger would threaten all of them. The individual has given up a part of his possibilities. If the hour of a battle were to come, every man knows that for him no individual rushing forward is possible, as for the soldiers on the battle-field. He cannot escape the ship which carries them all and with which they all will sink if it goes to the bottom. A closer union of a multitude of strangers cannot be imagined; the suggestibility must, therefore, be tremendously increased, and that means that the powers of the man are reinforced for good or for evil, that his individual resistance to the imitative impulses is decreased, and that he has become to a certain degree a passive instrument for the will of the leader. No superior can fail to make the fullest use of this power and to be aware of the lurking dangers. He must know that this increased suggestibility could be the condition for a panic among men no single one of whom would be frightened. But at the same time he can rely on it that this suggestibility will insure an enthusiastic and heroic fight if the right impulse and the right start are given, and that every single man may then be carried far

beyond the range of his individual spontaneity. As to the technical side of this control of the mass, one rule may be immediately deduced from these psychological principles.

If crowd consciousness is really only increased suggestibility, and suggestibility is only readiness to act according to a proposition, it will be of utmost importance to give the signal for any turn of mind by an impulse to real action. Do not try to awaken any ideas or conceptions or judgments, but release an action in the right direction by forcing any one man to carry it out, or, better still, by making the movement yourself, and you have won your case. One forward movement bears the whole mass forward, one backward movement ruins all. Even if you only go through the motions of an action to give an illusory suggestion of it which would not convince the individual, it will carry away the excited mass.

This suggestibility of the social group which composes the crew stands in an especially significant relation to the mental function which, after all, is the backbone of military service—obedience. Where the spirit of discipline is lacking, the military cause is lost. There never has been a victorious navy without obedience. To a certain degree the necessity of a dogged submission to the order has in the most modern ship become still more necessary than ever before, because the individual man is more isolated in his duties than in former times. He does not know what is going on in the battle; he does not see the others; he cannot understand the situation; he cannot lose a moment of time to find out what is going on; he simply has to obey his orders as long as life flickers in his soul. He cannot even be trained for this obedience in the hour of battle, because all training and all exercises and all manœuvers necessarily eliminate the mental factor which is ultimately the most important in the hour of the real fight, the emotion of fear. Whether the man will carry out the movements which the manœuver has taught when the cannons not only are thundering, but the balls really are splintering the ship, depends upon the one decisive question of whether an obedient submission to the order of the superior has become an instinct for his mind.

And here begins that complex relation to the suggestibility of the crew, inasmuch as the spirit of obedience itself is reinforced by the unified social consciousness of the mass,

while, on the other hand, the obedient carrying out of the order disturbs the social consciousness. I say the spirit of obedience is in itself fostered by the increased suggestibility with its imitativeness. To be obedient is the common function of all the men. They feel themselves as parts of that one unified organic fighting-machine which can fulfil its purpose only if strict discipline controls it, and the willingness to submit therefore becomes infectious. Hence the order of the commander is the highest duty for every one, and that contagious, imitative enthusiasm for the common cause against the enemy in every individual takes the form of an unquestioning spirit of subordination. The officer can, therefore, expect a much greater spirit of obedience from a member of that socialized group than from any single individual. But, on the other hand, the order goes from the commander to the man directly, and he has to fulfil his share without reference to what the other members of the crew have to do. To demand obedience to the order which is given to him individually may mean to force on him resistance to the suggestions of the social consciousness. Indeed, it is no real obedience unless it is strong enough to break up the unified will of the crowd. In this sense their education toward obedience demands a relentless suppression of the general suggestibility. The men must be trained by real discipline to have control of themselves in spite of all suggestions of their mates and to inhibit in their minds all merely imitative and yielding impulses. The psychologist knows no other way of training such a power of self-control but by a persistent strengthening and disciplining of the attention and the will.

We all know how much this self-discipline is weakened by the corrupting indulgence with which our modern age coddles the youth. We know how a pseudo-education which is controlled by fads and fancies fosters those go-as-you-please methods which yield to the whims and likings of the petted boys and girls, and how this pampered youth learns an abundance of scattered bits of knowledge, but fails to learn what alone makes life worth living, the power of attention and will which enforces the dutiful action against all temptations. The result is the superficiality of our public life with the lack of resistance to sensational and hysterical influences. Our whole modern world instinctively longs again for thoroughness and discipline and the teaching of

obedience. But the army and navy at least never lessen the firm grip of authority, and every officer ought to understand the mental conditions under which discipline can be developed. One psychological consideration must stand in the foreground. Discipline is the product of habit, and habit cannot become deep-rooted where any exceptions are admitted. Habits result from the physiological law that the uninterrupted repetition of actions transforms the nervous path into a path of less and less resistance. The submission to the order given and the faithful performance of the duty, in spite of all counter-stimulations, must be secured by such habituation of the brain paths. We cannot expect that the man will be always ready to play the hero and to force his energies to a maximum and to make great sacrifices in order to be obedient. The routine effect of a strong discipline can be reached only if this submission has become so habitual that it works as a matter of course without any need of excessive effort. The service must have made the man an exact machine which works automatically whenever the order reaches his consciousness.

Yet the true meaning of military discipline would be entirely missed if automatic obedience were considered as the only important demand, and if another postulate were neglected which stands in every respect co-ordinate, the demand for a spirit of initiative. Without this spirit the fighter would become a slave, and no nation can rely on its moral slaves. Initiative does not stand in a psychological contradiction to obedience. On the contrary, even the training in obedience demands a background of initiative, as the overcoming of the resistance will be successful only if every single act of submission is supported by a feeling of confidence and reliance in the leader, and this reliance, however much it may result from the imitative crowd consciousness, remains ultimately an act of personality and initiative.

But the spontaneity which the service has to develop in every man must go far beyond this mere internal free option for a leader. The commander controls a well-disciplined crew only if he can know that every man is ready to give orders to himself in the spirit of the whole when orders from above are lacking. Every man in the crew must be able and must be conscious of his ability to step into a position of responsibility. His intelligence and power of decision, accordingly, demand as much stimulation as his habit

of submission. It is this which ennobles the modern navy and gives to it values far beyond those of a mere mechanical fighting-machine. The idea is wide-spread that different views are possible on this question, that some navies do not believe in the initiative of the individuals because they are afraid that it will interfere with obedience and that the automatic machine-like functioning of the crew ought to be the ideal. For instance, it is a wide-spread belief among the officers of the American navy that this contrast of view characterizes the difference between the American and the German navy, the Americans believing in the spirit of initiative, the Germans in the spirit of obedience. Would it not be misleading to awaken the impression that an American naval officer undervalues the importance of obedience? After a serious study of this problem with reference to the German navy, I feel convinced that it is equally misleading to fancy that the leading men of the German navy believe less in the absolute value of the spirit of initiative in the navy than the Americans. I should rather say that the development of the last twenty years, as it is reflected in the German navy literature and in the spirit of the German navy officers, finds its real center in the persistent effort to create a strong sense of initiative and of individual responsibility and personal freedom in every man who is to fight on board of the cruiser. Initiative and obedience ought to belong together in the psychology of the naval man the world over.

We have spoken so far only of the psychology which the officer ought to know in order to understand his subordinates, but we have not spoken of the psychology of the officer himself. What are the significant features of his mind? To a certain degree, to be sure, he is not only in the same boat; he is also of the same mold of mind as the crew. He too is a part of that compact unity with its social consciousness and its increased suggestibility, sharing the common enthusiasm and sharing the common fears; and, above all, he too must combine the spirit of obedience with the spirit of initiative, however much the obedience is shaded into an intelligent carrying out of instructions as against the mechanical fulfilment of orders, and the initiative is heightened to a sense of responsibility toward every man on board and toward the nation. But in so far as the officer stands detached from the crew the mental character-

istics which are necessary for him are to a high degree dependent upon those psychological conditions of the crew. If the men are a suggestible mass, it is he who needs the power of suggestion. He must train in himself and develop to highest efficiency that unwavering firmness which overwhelms an easily impressed crowd and forces on it the will of the leader. If the officer shows signs of hesitation and of weak willingness to yield, lack of determination, or erratic fluctuation, his influence is paralyzed. Only the man of suggestive power can stop a panic by one short word or one vivid movement and by a gesture can transform fear into daring courage. Such suggestive power must draw its strength from auto-suggestion. An officer who allows himself to grow tired by the monotony of the service or by the exhausting work on board, or who becomes nervous or fussy or irritated, or who instinctively shrinks from the responsibility and always waits for the counsel of others, slowly loses the auto-suggestive hold on himself which is even more important than any knowledge. Whatever he can do to strengthen his nervous system, to enrich his intellect, to widen his horizon, to keep his instincts vigorous and his imagination vivid, his inspirations high, and his will decisions quick, all ought to contribute to that reliance on himself which strengthens the power of his auto-suggestive thought. Only then is he a true commander and leader. The difficulties which he has to overcome are multifold, as the conditions and the strain of the service work strongly toward automatization of his mental life, and this involves a weakening of that power of command with its independent self-reliance and its need for inexhaustible auto-suggestion. He has to overcome the resistance by sport and training, by social comraderie with his equals, by joy in the service as such, by intellectual interest in his duties, and by passionate love for his task; but, above all, by a systematic training of his will power.

This emphasis on the emotional traits of the leader does not contradict the demand which seems paramount in a war college, the training of abilities. However much an officer may have learned concerning ships and guns and ammunition, and even concerning the history of warfare, the knowledge alone does not prepare him for the great work which he is called to perform for the good of the nation in peace and in war. The development of abilities such as

have to be shown in the movements of the fleet or in the battle is dependent upon mental activities for which no mere knowledge can be substituted. They stand much nearer to art than to knowledge. We find this contrast in every field of human interests. The youngest pupil in a school has to gather some information and has to learn facts accessible to knowledge, and, on the other hand, has to win and exercise abilities. His power to read or to write or to calculate demands actual performance and can never be gained by mere theoretical demonstration. This doubleness remains the same through all stages of schooling up to the highest technical and professional preparations for life-work. The surgeon must learn his knowledge of medicine and exercise his ability to perform the operation. Yet these abilities which have to be acquired are acts of our minds and nervous systems. It is not necessary to train them on exactly those objects for which they are finally to be used. The only essential requirement is that really the same mental and physiological functions be involved which are needed in the decisive hour. To go through a real battle would be an impossible preparation. To go through a manœuver is, of course, only an approach, as every sham battle leaves out the real hatred of the enemy and therefore changes the final mental situation. But even such manœuvers with actual ships go far beyond what the routine training can bring to the individual officer. Hence he is obliged to reduce the mental situation still more and to substitute a naval-war game and the mastery of theoretical naval-war problems of actual warfare for the genuine fight. But if these miniature battles and these schematized wars of the college-room are well arranged, they can become a substitute in which the most essential mental functions of warfare are actually exercised.

The psychologist cannot too earnestly advise that emphasis be laid on such practical exercises. The training in all our technical activities from writing with a pen to mastering a musical instrument or a scientific apparatus demonstrates in ever new forms that the mere ability to go through the component acts of a complex action is not sufficient to guarantee success in the complex action itself. We must always consider the synthesizing of the part actions as a task in itself, which needs independent training. An officer may have learned to do this and to do that and to

respond to one condition in this and to another condition in that way, but he can never feel himself prepared for the right decision and right performance in the unified complex situation of the battle if he has not thoroughly trained himself in responding to the whole complexity of the situation. In every complex activity the whole is endlessly more than the mere sum of the parts, and that is the necessary result of the structure of our psychophysical system. The various layers of psychophysical units, one higher than another, have to take charge of the organization of our motor responses. In the first few weeks the man who is learning telegraphy only tries to give the signals for the single letters as quickly as possible, and the curve of his speed shows a steady ascent until he knows how to produce the single letters with the greatest possible speed. Then he reaches a period of standstill, until he is fully trained in this elementary ability, but afterward he enters into the second stage of training and learns to telegraph not letters, but whole words, and his speed in telegraphy quickly rises. In this second period he learns to synthesize the motor impulses for the single letters into complex movement innervations for whole words. This new ability is acquired after several months and then begins again a time of standstill. Finally he reaches the period of acquiring the highest ability, not accessible to every one—namely, the synthesizing of the word impulses into still more complex activities in which one motor stroke gives the impulse for the telegraphing of a whole phrase composed of several words. In this way the officer must learn to synthesize the thousand partial activities which he has learned as factors of the naval service. He needs exercise in that whole very complex setting from which the special actions then spring with automatic necessity.

While in this way ability must be developed in addition to mere knowledge, it is not fair to underestimate the knowledge. There are some who claim that such ability is instinct and that instinctive activities are essentially dependent upon inborn powers. The right commander sees by an intuition what he must do in the decisive moment. He has not even time to consider deliberately what possibilities are open, but with instinctive certainty he chooses the right one. This is perfectly true and yet entirely false. What we call our instinct in such cases is not an inborn disposition like that

for satisfying hunger or thirst; it is nothing but an ability to respond to the complex stimulus without a conscious awareness of the special steps which lead to the end. But in order to gain such an instinctive ability the connections must have been formed by persistent exercises into which perfectly conscious intentions and careful knowledge and learning have entered. The piano virtuoso plays without being conscious of the particular movements which at first had to be slowly learned. We all write and we all speak instinctively without choosing the special words or the special writing movements, but we had to learn them by slow study. Everything which we acquire through assiduous learning to-day has a chance of being transformed to-morrow into instinctive behavior which serves the ends without our being conscious of the steps which lead to them. It is a kind of mental abbreviation, a short cut which can never be reached without industry and patience. The officer who devotes faithful years of study, perhaps to the history of naval warfare, and earnestly thinks himself into the situation of every decisive battle, forms connections in his mind between the ideas of certain situations and the ideas of certain necessary responses and reactions which slowly become part of his instinctive behavior and actions.

We have said that every pupil in a school and every student in a profession has to learn knowledge and has to acquire abilities. But the aim of education could never be reached by those two ways alone. A third factor is necessary to complete the meaning of the school. Interests must be stimulated. Knowledge and abilities would be dead and useless unless a living interest stood behind them. Even the smallest child must have at least the interest of curiosity or of sympathy, and on a higher level we stimulate the logical and ethical and esthetic interests in order to prepare the youth for a valuable life-work. The interest which leads the scholar is not that which stimulates the artist, and the interest which guides the physician is not that which moves the lawyer, and the interest which inspires the minister is not that which controls the statesman. But there is no calling, high or humble, in which an emotional interest does not give force and meaning to the knowledge and abilities of the man. The knowledge and the ability of the naval officer, the one resulting from the intellectual functions of his mind, the other from the volitional powers of his mind,

would indeed be deprived of their real efficiency and value unless a strong, deep stream of interest flowed from the emotions of his mind.

These interests may be of many kinds. But it holds true of every vocation that many motives are intertwined in the mind. The surgeon is anxious to receive his fees in order to earn his livelihood, and this mercenary motive is combined with the social one of his ambition to have a respected name in the community for his professional work, and both motives are combined with the intellectual one of a serious interest in the scientific problems of his medical work; and yet even these three groups of motives would never make him a true physician and would never inspire him enough for the great task which he may have to perform at a bedside if there were not the ethical motive of the desire to help suffering mankind. In a similar way we may disentangle personal and social and idealistic motive elements in every vocation, but in none does their co-operation seem more important than in the mental structure of the naval officer. Of course there must be personal motives involved. The officer must think of earning his livelihood, of filling an honorable position, of advancing as quickly as possible in his career. But motives on a much higher level, motives which do not refer to the individual as such, but to ideal aims and purposes, must be intimately associated with the personal ones. He must feel joy in the service as such; he must have interest in the details of the work and in the problems which it offers; he must be determined by a consciousness of duty which gives him perfect satisfaction when he is loyal to his task, whatever sacrifices it may demand. Yet here again we must insist that even all these motives of a higher order are not sufficient to guarantee the ideal perfection of the officer's achievement. There must be one motive which is still deeper-rooted and which lies far beyond mere personal consideration.

What is needed as the central energy in the mind of the naval officer is an enthusiastic belief in the ideal value of the navy and the task of the navy. The teacher can never give his best if he is not inspired by the ideal belief in the incomparable value of educating the youth. The artist and the scholar cannot create works of lasting glory if they do not live in an unquestioning belief in the sacred mission of beauty and truth. The minister cannot be a true preacher

if pure religion is not the center of his soul. Such a belief, such an inspiration, such a religion, must penetrate and fill the mind of the officer. With every fiber of his personality he must feel that it is sacred work to which he is called, that the mission of the navy is an ideal one, and that the honor of the country is not too dearly paid for by his death.

The psychologist sees in all these demands for the highest unselfish motives, not simply beautiful phrases and romantic illusions. Even though he abstracts from the higher moral aspect and simply takes the standpoint of description and explanation, he must acknowledge that such an emotional belief is the strongest reservoir of the energies for psychophysical action. The teacher and the minister, the artist and the scholar, and with them the officer, may perform every single activity which is needed for their life-work by the mere interplay of ideas, by learning and training. But in every case the available power for activity would easily be exhausted. Any friction would interfere with the possible success, any selfish desire would inhibit the impulses, fatigue would weaken the work, chance distractions and temptations would lead to side activities. Wherever one great emotional motive synthesizes the life-work, the psychophysical energy can overcome those frictions and those temptations, those selfish motives, those difficulties and dangers. This is true of the mind of the masses as well as of the individual. The maximum effort and the faithful endurance through the hour of danger presuppose that high-pitched tension for which mere intellectual processes can never be a substitute. The psychologist, therefore, without any emotionalism on his part, but for strictly scientific reasons, must demand that every factor be inhibited which interferes with a whole-hearted surrender to the sacredness of the naval cause.

The daily routine work may easily be carried on by officers and men who lack this belief, and the smoothness of their performance may deceive the world concerning the perfunctory character of their service. The interference with this ultimately decisive attitude may result from many conditions. Among the bluejackets a great mental inhibition may come from the tendency to change the vocation. English observers seem to believe that here lies the central mental difficulty of the American navy, since it must be acknowledged that in no other country are the rank and file

of the population so easily inclined to change from one vocation to another. The minds of the officers, on the other hand, are perhaps most easily harmed by what has often been called the spirit of the steam-yachtsman. The steam-yachtsman danger is, psychologically, especially grave, because it so easily creeps in without at first allowing any one to perceive the difference between the right and the wrong attitude. The steam-yachtsman loves the ship and its handling, enjoys the life on the water, is deeply interested in all naval movements; and yet the whole setting of his mind is fundamentally wrong for the officer who has to prepare himself and his men for the heroic work in the crisis. It is a spirit of ease and comfort, of charming hospitality and delightful companionship, of self-satisfaction and good-natured sportsmanship. In many a foreign navy the true believers in sea power, therefore, dislike to see too many rich officers in the service, as their spirit of comfort and relaxation spreads far too much this steam-yachtsman attitude. There are not a few who believe that this difference alone was the real reason for the victory of the Japanese navy, in which such a steam-yachtsman element does not exist, over the Russian navy, in which it is said to be widespread.

But the social psychologist cannot overlook a still more dangerous rock which is threatening under the surface. The whole civilized world to-day is filled not only with the old vague wish for peace, but with a more modern conviction that means can be found to secure peace and to make war superfluous. The American nation is among the leaders in this international movement, and no educated man has a right to close his eyes to this tremendous problem of civilization. But just because it is appealing to an ideal demand and carries with it the promise of highest humanity, it is much more dangerous to the inner unity of the officer's mind than a mere appeal to comfort and selfishness. The mind of the warrior is thrown into a conflict between the demands of his life-work and the siren voices of the eternal peace advocates. How can the enthusiastic belief in the preparedness for war and in the relentlessness of the fight prevail in a mind which is touched by the doubt whether war among civilized nations is not brutal and immoral and criminal? It is one of the most important conditions for the success of the navy that such inner wavering be absolutely excluded

from the officer's mind. He is not for that purpose obliged to fall back to a barbaric hatred of the enemy with the mere longing to kill, nor has he to narrow his horizon and ignorantly to ignore these international peace movements. All that is needed is for him to see them in the right perspective. He will not deny the harm and the losses which war brings with it. But at the same time he will be deeply impressed by the tremendous moral power of a national self-defense which concentrates the energies of the whole nation in loyalty to its historical mission. He must grasp the fundamental rôle of war in the history of mankind as the great vehicle of progress, as the great eradicator of egotism, as the great educator to a spirit of sacrifice and duty.

Moreover, he must recognize how the state forms in which mankind has developed have been bound up with national rivalry and war and how our present age, in spite of its palace of international arbitration at The Hague, seems further removed from warlessness than many a previous period. And as soon as he has recognized that war is necessary and as soon as he has chosen to serve the nation in its military work, no argument against war ought to interfere with the unified setting of his loyal mind. A scholar may be convinced that the poet's imagination is a noble gift for the artist; and yet he must not allow himself to be carried away or even to be touched by this longing for imaginative flight when he is in the path of scholarship. The minister may be convinced that there is high value in the materialistic work of the naturalist; and yet his religious attitude must not be shaken by the demand for a godless universe. The ideals of the artist and of the scholar and of the preacher, of the peace reformer and of the warrior, are all true ideals, are each worthy to give meaning and significance to the life which is devoted to them.

But this significance and this meaning ultimately lie in devotion, and the deepest value is therefore lost if the faithful belief in any one of these ideals is choked by rival ideals. There is no fitness to win without unity of mind and certainty of purpose.

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